REMARKS

In the Office Action, claims 1-27 were rejected. By the present Response, claims 1, 12, 18 and 24 are amended. Upon entry of the amendments, claims 1-27 will remain pending in the present patent application. Reconsideration and allowance of all pending claims are requested.

First Rejection Under 35 U.S.C. § 102

The Examiner rejected claims 1 and 24-27 under 35 U.S.C. § 102(e) as being anticipated by Hirabayashi et al. (U.S. Pat. No. 6,101,282). Applicants have amended the claims and respectfully traverse this rejection. A *prima facie* case of anticipation under 35 U.S.C. § 102 requires a showing that each limitation of a claim is found in a single reference, practice or device. *In re Donohue*, 226 U.S.P.Q. 619, 621 (Fed. Cir. 1985). Thus, if a single element is missing, the rejection cannot stand.

Claim 1

The Examiner rejected claim 1 under 35 U.S.C. § 102(e) as being anticipated by Hirabayashi et al. (U.S. Pat. No. 6,101,282). Applicants have amended independent claim 1 and believe that the reference does not anticipate the amended claim. Specifically, amended claim 1 recites:

> A method for compressing image data from an uncompressed image data stream, the method comprising the steps of:
>
> (a) compiling and storing a plurality of compression mapping tables for converting uncompressed data representative of individual picture elements to lossless compressed data;
>
> (b) applying at least first and second compression mapping tables from the stored plurality of compression mapping tables to subregions of an uncompressed image data stream to compress the subregions; and
>
> (c) appending data for the compressed subregions to form a compressed image data stream.

The Hirabayashi et al. reference fails to disclose all of the elements within the recited claim. For example, the reference does not disclose "applying at least first and second compression mapping tables from the stored plurality of compression mapping tables to subregions of an uncompressed image data stream to compress the subregions." In addition, the reference fails to disclose "compiling and storing a plurality of compression mapping tables for converting uncompressed data representative of individual picture elements to lossless compressed data." Thus, the reference does not anticipate the claimed subject matter.

The Reference Fails to Disclose – "Compiling and Storing a Plurality of Compression Mapping Tables for Converting Uncompressed Data Representative of Individual Picture Elements to Lossless Compressed Data."

The Hirabayashi et al. reference fails to anticipate "compiling and storing a plurality of compression mapping tables for converting uncompressed data representative of individual picture elements to lossless compressed data," as recited in amended claim 1. In the rejection, the Examiner asserted that the recited feature is disclosed in step S7 of the Hirabayashi et al. reference. However, the Hirabayashi et al. reference does not *compile and store a plurality of compression mapping tables*, but creates a new optimal table for encoding the image in step S7. Hirabayashi et al., col. 7, lines 38-51. The image is encoded with a created table in Fig. 9 of the reference. Hirabayashi et al., col. 7, lines 60-62. Clearly, as the reference discloses using the created Huffman table to compress the image, it cannot disclose the recited feature. Consequently, the Hirabayashi et al. reference cannot anticipate "compiling and storing a plurality of compression mapping tables for converting uncompressed data representative of individual picture elements to lossless compressed data," as recited in claim 1.

The Reference Fails to Disclose – "Applying at Least First and Second Compression Mapping Tables from the Stored Plurality of Compression Mapping Tables to Subregions."

The Hirabayashi et al. reference fails to anticipate "applying at least first and second compression mapping tables from the stored plurality of compression mapping tables to subregions of an uncompressed image data stream to compress the subregions," as recited in amended claim 1. In the rejection, the Examiner asserted that the recited feature is disclosed in step S80 of the Hirabayashi et al. reference. However, as noted above, the reference does not use the stored plurality of compression mapping tables, but uses an optimal table prepared during the compression process for encoding the image. Hirabayashi et al., col. 7, lines 38-51. The method of the reference then uses the created Huffman table to compress the image. Further, the creation of a new table is again disclosed in the use of the Huffman encoder 109. Hirabayashi et al., col. 9, lines 56-66. The image is encoded based on the prepared Huffman table in the Huffman encoder 109. Thus, the Hirabayashi et al. reference cannot anticipate *applying* "the stored plurality of compression mapping tables to subregions of an uncompressed image data stream to compress the subregions," as recited in claim 1.

Because the reference fails to show that the cited reference discloses *all* of the claimed elements, the reference fails to support a *prima facie* case of anticipation. Therefore, independent claim 1 is believed to be patentable over the Hirabayashi et al. reference.

Claim 24 and Claims Depending Therefrom

The Examiner also rejected independent claim 24 and dependent claims 25-27 under 35 U.S.C. § 102(e) as being anticipated by Hirabayashi et al. (U.S. Pat. No. 6,101,282). Applicants have amended independent claim 24 and believe that the reference does not anticipate the amended claim. Amended claim 24 recites:

> A computer program for compressing image data, the program comprising:
> a machine readable medium; and
> configuration code and a plurality of compression code tables stored on the machine readable medium, the configuration code including an algorithm for analyzing an image data stream, for compressing subregions of the image data stream by application of a plurality of compression code tables, and for compiling the compressed subregions into a lossless compressed data file.

The Hirabayashi et al. reference fails to disclose all of the features within the recited claim. For example, the reference does not disclose "compressing subregions of the image data stream by application of a plurality of compression code tables." In the rejection, the Examiner asserted that the encoder 104 discloses the recited feature. However, the encoder 104 in the Hirabayashi et al. reference does not compress the image data stream with *a plurality of compression code tables*, but uses a single reference Huffman table. Hirabayashi et al., col. 9, lines 6-12. Similarly, even in the second embodiment, a single Huffman reference table is utilized to encode the image in encoder 104. Hirabayashi et al., col. 10, lines 23-29. Indeed, the reference only teaches that a single Huffman table is used by the encoder to encode the image. Clearly, because the reference teaches using a single Huffman table, the Hirabayashi et al. reference does not anticipate the recited feature.

Because the reference fails to show that the cited reference discloses *all* of the claimed elements, the reference fails to support a *prima facie* case of anticipation.

Therefore, independent claim 24 and its respective dependent claims 25-27 are believed to be patentable over the Hirabayashi et al. reference.

Second Rejection Under 35 U.S.C. § 102

The Examiner rejected independent claim 18 and dependant claims 19-23 under 35 U.S.C. § 102(e) as being anticipated by Puri (U.S. Pat. No. 5,563,593). Applicants have amended independent claim 18 and believe that the reference does not anticipate the amended claim. Specifically, amended claim 18 recites:

> A system for storing, transmitting and viewing images, the system comprising:
>
> a data compression station configured to store a plurality of compression code tables for conversion of image data to lossless compressed image data and to execute a compression routine in which an image data stream is converted to a compressed file by dividing into subregions and each subregion compressing in accordance with a compression code table selected from the plurality of compression code tables based upon which compression code table provides optimal lossless compression of the subregion;
>
> a data storage device for receiving and storing the compressed file; and
>
> an image decompression station configured to store the plurality of compression code tables, to access the compressed file from the data storage device, and to execute a decompression routine in which the compression code tables applied to compress the image data stream are applied to decompress the compressed file to reconstruct the image data stream.

The Reference Fails to Disclose – "a Data Compression Station Configured to Store a Plurality of Compression Code Tables for Conversion of Image Data to Lossless Compressed Image Data."

The Puri reference fails to anticipate "a data compression station configured to store a plurality of compression code tables for conversion of image data to lossless compressed image data," as recited in independent claim 18. In the rejection, the Examiner asserted that the Discrete Cosine Transform (DCT) events in Puri represent image data. Further, the Examiner admitted that the Puri reference teaches that variable length encoding tables are applied to *DCT events* to compress/encode using encoder 915. Yet, in the Puri reference, DCT events are encoded, not *image data*. In the Puri reference, DCT events are described as the output of a transform encoder that are quantized to form coefficients. Puri, col. 1, lines 46-52; col. 3, lines 4-6 and lines 39-46. The DCT events are actually encoded DCT coefficients that have been further quantized. The quantization of the image decreases the number of bits needed to store an image by reducing the precision of the image. As a result, the DCT events are not equivalent to image data because the original image data is lost and only a less precise version is represented by the DCT events. Accordingly, in view of the fact that the Puri reference quantizes the DCT coefficients, the Puri reference cannot disclose the recited feature.

The References Fail to Disclose – "Optimal Lossless Compression of the Subregion."

Furthermore, the Puri reference fails to disclose "optimal lossless compression of the subregion," as recited in amended claim 18. In the Puri reference, the DCT coefficients are quantized, which decreases the number of bits needed to store an image by reducing the precision of the image. Puri, col. 5, lines 34-38; col. 7, lines 4-15. The quantization process is a lossy compression process that reduces the bits needed through a many to one mapping. As one skilled in the art would recognize, the quantization of the DCT coefficients results in a lossy compression process, as illustrated by the definitions provided in the attached

exhibit. Specifically, the exhibit includes three pages of definitions regarding various compression techniques found at the time of preparation of the present response at the URL, http://my.engr.ucdavis.edu/~ssaha/glossary.html. Applicants submit that these definitions reflect the understanding of one skilled in the art. Thus, as a result of quantizing the DCT coefficients, the Puri reference cannot disclose a lossless compression of the image. Thus, the Puri reference does not disclose the recited feature of "providing lossless compression of the subregion," as recited in the amended claim 18.

Because the Puri reference fails to disclose *all* of the claimed elements, the reference cannot anticipate the claimed subject matter. Therefore, independent claim 18 and dependent claims 19-23 are believed to be patentable over the Puri reference.

Rejection Under 35 U.S.C. § 103

The Examiner rejected independent claim 12 and dependent claims 2-11 and 13-17 under 35 U.S.C. § 103(a) as being unpatentable over Hirabayashi et al. (U.S. Pat. No. 6,101,282) in view of Puri (U.S. Pat. No. 5,563,593). Applicants have amended independent claim 12 and believe that amended claim is not rendered obvious by the proposed combination.

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill

in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). When prior art references require a selected combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gained from the invention itself, i.e., something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988). One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

Claims 12 and Claims Depending Therefrom

Amended claim 12 recites:

> A method for compressing image data, the method comprising the step of:
> (a) defining a family of compression code tables for converting uncompressed image data to lossless compressed data;
> (b) storing the compression code tables in an image data compression station and in an image data decompression station;
> (c) selecting at least two of the compression code tables for compression of subregions of an image data stream;
> (d) compressing the image data stream in accordance with the selected compression code tables at the compression station for decompression at the decompression station.

Applicants contend that the Hirabayashi et al. and the Puri references fail to disclose all of the recited features of the claims. The Hirabayashi et al. reference and the Puri reference, alone or in the proposed combination, fail to disclose at least one of the claimed elements, such as "storing the compression code tables in an image data compression station and in an image data decompression station." In addition to the

missing features, the Hirabayashi et al. and the Puri references cannot properly be combined because the teachings of these references are actually directed to different compression techniques and different methods of using the compression tables.

The References Fail to Disclose – "Storing the Compression Code Tables in an Image Data Compression Station and in an Image Data Decompression Station."

Applicants contend that the Hirabayashi et al. and the Puri references fail to disclose "storing the compression code tables in an image data compression station and in an image data decompression station" as recited in amended claim 12. In the rejection, the Examiner admitted that the Hirabayashi et al. reference does not explicitly teach storing compression/encoding tables in the image data compression/encoding station. The Examiner asserted that this feature is taught by Puri. As discussed above, the Hirabayashi et al. reference teaches creating an optimal Huffman table that is used to encode the image. The table cannot be stored at another station because the Huffman table used to encode the image is not created prior to the image being processed. As a result, the created table must be transmitted with the image for the image to be decompressed.

The Puri reference fails to cure the deficiencies in the Hirabayashi et al. reference with regard to the recited feature. Again, as previously discussed, the Puri reference teaches encoding the quantized DCT events of an image. The Puri reference fails to disclose the recited feature because the quantized DCT events are not equivalent to image data. As the quantization process is a *lossy* compression process, it reduces the original image through a many to one mapping. From this compressed data the original image can only be recreated as a less precise version. By quantizing the DCT coefficients, the Puri reference cannot disclose *storing compression code tables* that are utilized in *lossless compression*, because quantization implies lossy compression. *See exhibit.* Furthermore, the tables in the Puri reference

are utilized to encode quantized DCT events, which is not equivalent to image data. Thus, the Puri reference fails to disclose or teach *storing compression code tables*. Accordingly, the Hirabayashi et al. and the Puri references fail to disclose or teach "storing the compression code tables in an image data compression station and in an image data decompression station" as recited in amended claim 12.

There is No Suggestion or Motivation for Combining the References as Proposed.

Even if the references included all of the claimed elements, the Examiner has failed to point to a convincing suggestion or motivation for the combination. Indeed, the references are actually directed to different methods of encoding that handle the original image in completely different manners. Further, the Hirabayashi et al. and Puri references actually teach handling the compression tables in different manners that are not compatible with each other. Given the disclosures and teachings of the respective references, the combination of Hirabayashi et al. and the Puri references is not supported by the references.

In the present case, the references do not support any proposed combination. As discussed above, the Hirabayashi et al. reference is directed to a technique for creating a new Huffman table for encoding the image in step S7. Hirabayashi et al., col. 7, lines 38-51. The creation of a new table is disclosed as a role of the Huffman encoder 109, which encodes the image. Hirabayashi et al., col. 9, lines 56-66. To allow another to decompress the encoded image, the prepared table is attached to the image frame to allow the decpompression of the image. Hirabayashi et al., col. 10, lines 6-9. The encoding of the image in the Hirabayashi et al. reference appears to be lossless compression technique that allows the original image to be recreated.

Conversely, the Puri reference is directed to a means of lossy compression that alters and is unable to reproduce the original image. The Puri reference teaches encoding DCT events, which are not *image data*. In fact, the DCT events are

described as the output of a transform encoder that are quantized to form the DCT events. Puri, col. 1, lines 46-52; col. 3, lines 4-6 and lines 39-46. Again, by quantizing the DCT events, the number of bits in the original image is reduced and the precision of the original image is lost. As a result, the DCT events are not equivalent to image data because the DCT events are quantized. The lossy compression technique taught in the Puri reference does not disclose or suggest the lossless compression technique of the Hirabayashi et al. reference. In fact, the two approaches are completely incompatible compression methods that cannot be combined.

Furthermore, each of the references teaches decompressing the images in mutually exclusive and incompatible manners. In the Puri reference, the tables are known and located at a remote encoder for decompression of the DCT events. In contrast, the Hirabayashi et al. reference actually teaches including the prepared Huffman table with the image frame. As discussed above, a Huffman table is created for compressing the image, the table employed being *unique to the image*. The prepared Huffman table has to be included with the compressed image because the system that receives the compressed image may not be able to decompress the image without the prepared Huffman table. Clearly, the methods are completely incompatible because one of references requires the compression table to be sent with the image, while the other reference uses existing tables at the receiving end to process the image. Thus, the Hirabayashi et al. and Puri references actually teach handling the compression tables in different manners that are not compatible with each other. Accordingly, the Hirabayashi et al. and Puri references, alone or in combination, fail to provide a suggestion for the combination.

Because the references fail to disclose *all* of the claimed elements, and cannot be combined as proposed by the Examiner, independent claim 12 and its respective dependent claims are believed to be patentable over Hirabayashi et al. and Puri.

Claims 2-11

Applicants believe these claims are patentable based upon both their dependence on patentable claim 1, and their recited subject matter. In the rejection, the Examiner used the Puri reference to disclose using compression/encoding tables to map a prediction error, to select compression/encoding tables, selection based on entropy, to select on shortest image data stream, and encoding the identifier representative of the compression/encoding tables. However, as discussed above, the Hirabayashi et al. fails to disclose the recited features of independent claim 1. In addition, the Puri reference fails to cure the deficiencies of the Hirabayashi et al. reference. Furthermore, as previously discussed, the combination of the references is not supported by the teachings of the references. Accordingly, Applicants respectfully request withdrawal of the Examiner's rejection and allowance of the pending claims 2-11.

Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims 1-27. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Attached hereto is a marked-up version of the changes made to the drawings and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**."

Date: 02/28/2003

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please amend claims 1, 12, 18, and 24 as follows:

1. (Once amended) A method for compressing image data from an uncompressed image data stream, the method comprising the steps of:

(a) compiling <u>and storing</u> a plurality of compression mapping tables for converting uncompressed data representative of individual picture elements to <u>lossless</u> compressed data;

(b) applying at least first and second compression mapping tables from the <u>stored</u> plurality of compression mapping tables to subregions of an uncompressed image data stream to compress the subregions; and

(c) appending data for the compressed subregions to form a compressed image data stream.

12. (Once amended) A method for compressing image data, the method comprising the step of:

(a) defining a family of compression code tables for converting uncompressed image data to <u>lossless</u> compressed data;

(b) storing the compression code tables in an image data compression station and in an image data decompression station;

(c) selecting at least two of the compression code tables for compression of subregions of an image data stream;

(d) compressing the image data stream in accordance with the selected compression code tables at the compression station for decompression at the decompression station.

18. (Once amended) A system for storing, transmitting and viewing images, the system comprising:

a data compression station configured to store a plurality of compression code tables for conversion of image data to lossless compressed image data and to execute a compression routine in which an image data stream is converted to a compressed file by dividing into subregions and each subregion compressing in accordance with a compression code table selected from the plurality of compression code tables based upon which compression code table provides optimal lossless compression of the subregion;

a data storage device for receiving and storing the compressed file; and

an image decompression station configured to store the plurality of compression code tables, to access the compressed file from the data storage device, and to execute a decompression routine in which the compression code tables applied to compress the image data stream are applied to decompress the compressed file to reconstruct the image data stream.

24. (Once amended) A computer program for compressing image data, the program comprising:

a machine readable medium; and

configuration code and a plurality of compression code tables stored on the machine readable medium, the configuration code including an algorithm for analyzing an image data stream, for compressing subregions of the image data stream by application of a plurality of compression code tables, and for compiling the compressed subregions into a lossless compressed data file.